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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,618	02/19/2004	Noriyuki Sudou	04995/136001	5101

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EXAMINER	
ESTREMSKY, SHERRY LYNN	
ART UNIT	PAPER NUMBER
3681	

DATE MAILED: 06/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/782,618	SUDOU, NORIYUKI	
	Examiner	Art Unit	
	Sherry L. Estremsky	3681	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 9-11* is/are rejected.

7)☒ Claim(s) *8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claim 4 is objected to because of the following informality: it appears "formed symmetry" should be --formed with symmetry-- or --formed symmetrically-- or equivalent. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 3 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear how many connecting walls are being claimed by "a second connecting wall" since no first connecting wall was previously claimed (a first connecting wall was claimed in claim 2,

but claim 3 is dependent on claim 1). The claim appears to be claiming one wall in that it claims "a...wall" and describes only one wall, on the other hand, it appears to be claiming two walls in that it uses the word "second". The scope of claim 3 is uncertain.

It is not clear if "the short pinion shafts" in claim 9 is intended to claim that there are multiple short pinion shafts, as opposed to the "a short pinion shaft" claimed in claim 5.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Michael, U. S. Patent 3,894,447.

Michael discloses a differential apparatus including pinion shafts 54, 58, and 66 radially arranged on a rotary member 20, as best shown in figure 2.

Pinions 46, 48, 50, and 52 are rotatably supported on the pinion shafts.

A pair of side gears 22 and 24 mesh with the pinions and are disposed coaxially with the rotary member.

The bore 56 is part of a junction at which the pinion shafts 54, 58, and 66 are connected to each other by themselves.

(claim 1)

The junction includes a first connecting wall formed between the pinion shaft 58 and the pinion shaft 54, which are adjacent each other in a rotational direction of the rotary member, which restricts axial movement of the pinion shaft 54 (best shown in figure 2; column 2, lines 51-55).
(claim 2)

The junction also includes a connecting wall which restricts a rotational movement of the pinion shaft 54 (best shown in figure 1; column 2, lines 51-55).
(claim 3)

Pinion shaft 54 is formed symmetrically with respect to a rotational axis A-A of the rotary member 20.
(claim 4)

The pinion shafts include a long pinion shaft 54 and a short pinion shaft 58 (with a long projection 62) at a right angle thereto.
(claim 5)

The hole 56 in the long pinion shaft 54 is a concave portion.
(claim 6)

The long pinion shaft 54 includes a hole 56, and the short pinion shaft 58 has a projection 62 formed on its axial end. The projection 62 is inserted in the hole 56 so that the long pinion shaft 54 and the short pinion shaft 58 are connected to each other.
(claim 7)

7. Claims 1-6 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Breed et al., U. S. Patent 3,974,717.

Breed et al. discloses a differential apparatus including pinion shafts 19, 20, and 22 radially arranged on a rotary member 2, as best shown in figure 2.

Pinions 17, 18, 25, and 26 are rotatably supported on the pinion shafts.

A pair of side gears 10 and 14 mesh with the pinions and are disposed coaxially with the rotary member.

The pinion shafts 19, 20, and 22 are connected to each other by themselves at a junction. (claim 1)

The junction includes a first connecting wall formed between the pinion shaft 22 and the pinion shaft 20, which are adjacent each other in a rotational direction of the rotary member, which restricts axial movement of the pinion shaft 22 (best shown in figure 2).
(claim 2)

The junction also includes a connecting wall which restricts a rotational movement of the pinion shaft 22 (best shown in figure 3).
(claim 3)

Pinion shaft 22 is formed symmetrically with respect to a rotational axis of the rotary member 2.
(claim 4)

The pinion shafts include a long pinion shaft 22 and a short pinion shaft 20 at a right angle thereto.
(claim 5)

The recess 73 in the long pinion shaft 22 is a concave portion.
(claim 6)

A pair of grooves 72 and 73, including bottom surfaces, are formed in the long pinion shaft 22.

The bottom surfaces of the pair of grooves contact axial end surfaces of short pinion shafts 20 and 19.
(claim 9)

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Michael in view of Yamazaki, U. S. Patent 6,027,422.

Michael discloses a differential apparatus as discussed above in the rejection of claim 1, including an inner rotary member and the pinion shafts being radially arranged on the inner rotary member.

Michael does not disclose that the rotary member includes an outer rotary member in which the inner rotary member is fitted and capable of being connected with and disconnected from by a clutch tooth.

Yamazaki shows in figure 2 a differential assembly similar to that of Michael, including pinions 23 rotatably supported on at least one pinion shaft 22 and a pair of side gears 24 and 25 meshed with the pinions and coaxial with a rotary member 26/21. The rotary member 26 is an inner rotary member, and rotary member 21 is an outer rotary member.

The inner rotary member 26 is movably fitted in the outer rotary member 21 and is capable of being connected with and disconnected from the outer rotary member by a clutch tooth 26A/29A.

The pinion shaft(s) are arranged on the inner rotary member.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Michael to make the rotary member an inner rotary member within and connectable to an outer rotary member by a clutch tooth in view of Yamazaki because such an arrangement allows in a four wheel drive vehicle switching between a two wheel drive state and a four wheel drive state (Yamazaki, column 1, lines 7-13).

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Michael in view of Friedl et al., U. S. Patent 5,273,499.

Michael discloses a differential apparatus as described above in the rejection of claim 1, but does not disclose a clutch tooth provided on at least one of the side gears capable of being connected with and disconnected from the rotary member.

Friedl et al. shows in figure 1 a portion of a differential apparatus with pinions 20 rotatably supported on pinion shafts 23 and a pair of side gears 30 and 35 meshing with the pinions and disposed coaxially with a rotary member 10.

A clutch tooth 51 is provided on at least one of the side gears 30 and is capable of being connected with and disconnected from the rotary member 10 (by clutch tooth 61).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Michael to include a toothed clutch between a side gear and the rotary member in view of Friedl et al. because a clutch between a differential side gear and rotary member provides a locking function (to transmit driving torque to the vehicle wheels even when one wheel slips) for a differential, and such a clutch is capable of keeping itself engaged with a small retaining force, and can engage and disengage quickly and easily (Friedl et al., column 5, lines 1-2; column 1, lines 15-21).

Allowable Subject Matter

11. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U. S. Patent 1,461,102 (Sternbergh) July 1923 - discloses a differential apparatus including pinion shafts radially arranged on a rotary member. Pinions are rotatably supported on the pinion shafts. A pair of side gears mesh with the pinions and are disposed coaxially with the rotary member. The pinion shafts are connected to each other by themselves at a junction.

U. S. Patent 3,344,688 (Frost) October 1967 - discloses a differential apparatus including radially arranged pinion shafts. One set of pinion shafts include extensions which fit into holes in a member interconnecting another set of pinion shafts.

U. S. Patent 4,856,372 (Williamson) August 1989 - discloses a differential apparatus in which one pinion shaft passes though a hole in another pinion shaft.

U. S. Patent 5,059,160 (Raniero) October 1991 - discloses a differential apparatus in which perpendicular pinion shafts include features at a junction which prevents axial and rotational movement of the shafts relative to one another.

U. S. Patent 5,647,814 (Krisher) July 1997 - discloses a differential apparatus in which perpendicular pinion shafts, one long and two short, include features at a junction which prevents axial and rotational movement of the shafts relative to one another.

EP 321335 (Bouveret) June 1989 - discloses a differential apparatus in which perpendicular pinion shafts include features at a junction which prevents axial and rotational movement of the shafts relative to one another.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sherry L. Estremsky whose telephone number is (571) 272-7090. The examiner can normally be reached on Tuesday and Friday from 7:30 a.m. to 6:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor can be reached on (571) 272-7095. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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SHERRY ESTREMSKY
PRIMARY EXAMINER
AU3681 6-17-05